

CLAIMS

WE CLAIM:

- 5 1. A stator for a rotating electrical machine, comprising:
 a stator core having an outer circumferential surface and an opening
 therethrough that forms an inner circumferential surface;
 at least two longitudinal slots formed in the inner circumferential surface
 of the stator core; and
10 at least one stator coil having a first slot-insertion segment and a second
 slot-insertion segment interposed by a non-slot-insertion segment, the first and
 second slot-insertion segments extending parallel to one another in a first plane
 and inserted, one each, within a separate slot, the non-slot-insertion segment
 having a first non-twisted segment and a second non-twisted segment interposed
15 by a twisted segment,
 wherein the twisted segment is twisted a predetermined number of degrees
 and includes at least a portion thereof that is bent at a predetermined angle relative
 to a second plane that is parallel to the first plane.

- 20 2. The stator of Claim 1, wherein the non-slot-insertion segment is
 generally V-shaped and includes an apex at a predetermined position thereon.

- 25 3. The stator of Claim 2, wherein the apex is located on the twisted
 segment.

4. The stator of Claim 1, wherein the non-slot-insertion segment
 extends in a direction away from the first and second slot-insertion segments
 generally toward the outer circumference of the stator core.

5. The stator of Claim 1, wherein the predetermined number of degrees of the twist is approximately 180°.

6. The stator of Claim 1, wherein the predetermined angle of the bend
5 is approximately 45°.

7. A stator for a rotating electrical machine, comprising:
a stator core having an outer circumferential surface and an opening
therethrough that forms an inner circumferential surface;
at least two longitudinal slots formed in the inner circumferential surface
of the stator core; and

5 at least one stator coil having a first slot-insertion segment and a second
slot-insertion segment interposed by a generally V-shaped non-slot-insertion
segment, the first and second slot-insertion segments extending parallel to one
another in a first plane and inserted, one each, within a separate slot, the non-slot-
insertion segment having an apex formed thereon at a predetermined position,
10 wherein the apex is bent at a predetermined angle relative to a second
plane that is parallel to the first plane, and includes at least a portion thereof that is
twisted a predetermined number of degrees.

15 8. The stator of Claim 7, wherein the non-slot-insertion segment
includes a first non-twisted segment and a second non-twisted segment interposed
by the apex.

20 9. The stator of Claim 7, wherein the non-slot-insertion segment
extends in a direction away from the first and second slot-insertion segments
generally toward the outer circumference of the stator core.

25 10. The stator of Claim 7, wherein the predetermined number of
degrees of the twist is approximately 180°.

11. The stator of Claim 7, wherein the predetermined angle of the bend
is approximately 45°.

12. A rotating electrical machine, comprising:
a rotationally mounted rotor; and
a stator surrounding the rotor, the stator including:
5 a stator core having an outer circumferential surface and an opening therethrough that forms an inner circumferential surface,
 at least two longitudinal slots formed in the inner circumferential surface of the stator core, and
 at least one stator coil having a first slot-insertion segment and a second slot-insertion segment interposed by a non-slot-insertion segment, the first and second slot-insertion segments extending parallel to one another in a first plane and inserted, one each, within a separate slot, the non-slot-insertion segment having a first non-twisted segment and a second non-twisted segment interposed by a twisted segment,
 wherein the twisted segment is twisted a predetermined number of degrees and includes at least a portion thereof that is bent at a predetermined angle relative to a second plane that is parallel to the first plane.

10

13. The machine of Claim 12, wherein the non-slot-insertion segment is generally V-shaped and includes an apex at a predetermined position thereon.

15

14. The machine of Claim 13, wherein the apex is located on the twisted segment.

20

15. The machine of Claim 12, wherein the non-slot-insertion segment extends in a direction away from the first and second slot-insertion segments generally toward the outer circumference of the stator core.

25

16. The machine of Claim 12, wherein the predetermined number of degrees of the twist is approximately 180°.

30

17. The machine of Claim 12, wherein the predetermined angle of the bend is approximately 45°.

5 18. The machine of Claim 12, wherein the machine is configured as a generator.

19. The machine of Claim 12, wherein the machine is configured as a motor.

20. A coil for insertion into a stator core, comprising:
a first slot-insertion segment extending in a first plane;
a second slot-insertion segment extending parallel to the first slot-insertion
segment in the first plane; and
5 a non-slot-insertion segment coupled to the first and second slot-insertion
segments together, the non-slot-insertion segment having a first non-twisted
segment and a second non-twisted segment interposed by a twisted segment,
wherein the twisted segment is twisted a predetermined number of degrees
and includes at least a portion thereof that is bent at a predetermined angle relative
10 to a second plane that is parallel to the first plane.

21. The coil of Claim 20, wherein the non-slot-insertion segment is
generally V-shaped and includes an apex at a predetermined position thereon.

15 22. The coil of Claim 21, wherein the apex is located on the twisted
segment.

23. The coil of Claim 20, wherein the non-slot-insertion segment
extends in a direction away from the first and second slot-insertion segments.

20 24. The coil of Claim 20, wherein the predetermined number of
degrees of the twist is approximately 180°.

25. The coil of Claim 20, wherein the predetermined angle of the bend
is approximately 45°.

26. A method of assembling a stator core for a rotating electrical machine, the method comprising:

providing a stator core having an outer circumferential surface and an opening therethrough that forms an inner circumferential surface;

5 forming at least two longitudinal slots in the inner circumferential surface of the stator core;

providing at least one stator coil having:

a first slot-insertion segment extending in a first plane,

10 a second slot-insertion segment extending parallel to the first slot-insertion segment in the first plane, and

15 a non-slot-insertion segment coupled to the first and second slot-insertion segments together, the non-slot-insertion segment having a first non-twisted segment and a second non-twisted segment interposed by a twisted segment, wherein the twisted segment is twisted a predetermined number of degrees and includes at least a portion thereof that is bent at a predetermined angle relative to a second plane that is parallel to the first plane; and

20 inserting the first and second slot-insertion segments, one each, within a separate slot.